From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: John Mckee <jmckee@rfmd.com>
Subject: [6933] 40-9er measurements
Message-ID: <199604101853.OAA28964@mh004.infi.net>

Gang,

Bob Kellogg AE4IC let me borrow his newly assembled 40-9er and make
a few measurements.  We thought the rest of the 40-9er owners would like
to see the results.

I measured the transmitter performance and got the following results.

Supply voltage = 9volts
Power output = 235mW
Second harmonic = -27.8dB below the fundamental
Supply current = 85mA TX / *18mA RX

Supply voltage = 12volts
Power output = 480mW
Second harmonic = -24.3dB below the fundamental
Supply current = 125mA TX / *20mA RX

*This rig had some modifications to boost audio gain

I used an HP8595E spectrum analyzer for the harmonic measurement
and a Rhode & Schwarz NRVD power meter for the power measurement.

I was amazed how well such a simple receiver can work.  Also, I listened
to the transmitter operated into a 50 ohm load and my inverted vee.  The
40-9er sounds as good as any commercial rig.

With all the 40-9ers out there, maybe we should have a 40-9er hunt.  That
would give the rigs a good work out.

Hope this information is useful.

72

John WB4OFT

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: gary-r-hanson@uiowa.edu (Gary R. Hanson)
Subject: [6930] 40-9er web site
Message-ID: <v0213050cad91a628971d@[128.255.164.50]>

Hi Gang,

I thought you might be interested in my finished 40-9er so I created a WEB page. I put some pictures and a short sound-clip recorded off the air (about 13 seconds worth) so you can hear what I hear with a lousy indoor antenna. I used really cheap sound recording equipment and then compressed the file so it wouldn't take up so much room or take so long to download (varies from 30 seconds at night to 2.5 minutes at mid-day). High fidelity purists will cringe!!! Also, you will need some software that will play .aiff sound formats to hear it. I use either SoundMachine or SoundApp on my Mac. Both are freeware/shareware.

Here is the URL for my page: http://uts.cc.utexas.edu/~hansong/

Jerry Parker said he would add a link from the NorCal Web Site page so you might find it from there as well.

I hope more and more of you will share your rigs with pictures on the web site. I'm looking forward to it.

72,73

Gary R. Hanson

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: Joel Malman <malman@bbnplanet.com>
Subject: [6931] 49er parts, artwork
Message-ID: <9604101359.aa00343@poblano.bbnplanet.com>

I was looking for the 49er parts and artwork layout in the archives, but could not find it.

Are the layouts available in maybe postscript format?

/joel

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6904] Alternative VFO
Message-ID: <316b3668.pandora@pandora.lugs.org.sg>

Hi,

I was just thinking of other ways we could implement digitally controlled VFO's and this occured to me.

Right now there are available some very cheap and high performance microcontrollers such as the MicroChip PIC parts, which are easy to use yet offering unprecedented power. Would it therefore be possible to use this as the VFO controller directly. The idea is as follows:-

I have seen a 50 MHz frequency counter implemented using one of these PIC's and I believe the resolution was close to, or at 100 Hz. If this is possible, then would it be possible to have the PIC control a DAC which in turn controls the VCO. The PIC samples the frequency and changes the high resolution DAC to correct for drifts, etc, for a given frequency? This is very similar to a PLL concept but it is done digitally. I know the PIC comes in 20 MHz varieties so while the lock-up time for such a scheme may be a little slow, it could be alleviated somewhat by the use of high speed parts? This will greatly simplify the digital VFO design and the parts count will still be low.

Has anyone actually done this?

73 de 9V1ZV Daniel
--
Daniel Wee | daniel@pandora.lugs.org.sg
9V1ZV | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: Steve Thompson AB7PF <kj7dn@primenet.com>
Subject: [6906] Announcement: QRPTTF Air Mobile
Message-ID: <Pine.BSD.3.91.960409215553.16529C-100000@usr6.primenet.com>

Hi:

The following announcement was made last Saturday, but I have since heard that some people didn't get it. So, here's a re-run. If you already got it, please excuse the bandwidth. 73!

******** ANNOUNCEMENT ********

The AB7PF/AM (Air Mobile) crew pulled off a successful test flight last Saturday and we're ready to announce our plans for this year's "QRP to the Field".

On April 27th, five hams will take it to the skies to operate from the cabin of a Cessna 421C.  We have completed a successful test flight, which proved that the homebrew boom and longwire in tow act as a great antenna.

Our operation is planned to take us on a five hour non-stop flight originating from and returning to Mesa, Arizona's, Falcon Field.  The airborne ham shack will sport a Kenwood TS-690 running QRP on 40, 17 and 10 meters, and an ICOM W31A operating on 2M and 440.  The HF operations will be CW and phone, and VHF/UHF will be phone only.  The entire crew will be hams, including pilot and co-pilot.

Our preliminary (and still flexible) route will begin heading east to overfly the Riley, NM, QRP operation.  After a fly-by and some great contacts, we could perhaps overfly some other "QRP to the Field" operations in the "Four Corners" area.  We will finish off the journey by overflying the scQRPions operating site here in Arizona.  Of course, we will be working contacts during the entire flight.  Any groups who have an operating position in these general areas are encouraged to contact us so that we can, perhaps, head over your QTH.

Detailed flight route and planned frequencies will be announced during the week before the contest.  Although not guaranteed yet, we are planning to design a *neat* QSL certificate!  Below are excerpts of the test flight results which have been distributed to those who have helped me get this project off the ground (no pun intended, hehe).  I thought it would be fun to share the excitement with you.

With thanks to Dave, AA7TQ, there will be a special Web page set up for the AB7PF/AM Operation.  It will give details of the operation and will include some pictures of the crew, aircraft, and antenna design!  As soon as the page is available, it will be announced on QRP-L.

73 - and we, the AB7PF/AM Crew, look forward to working you from the skies on April 27th!

Steve - AB7PF

```
Crew:  Steve Thompson - AB7PF  - CW Op
       Ron Thompson   - AB7LL  - Pilot
       Stephen Marvin - KC7OMT - Phone Op
       Doug Pelley    - WB7TUJ - Co-Pilot
       <one more TBA>          - CW Op
```

*****  To:  Air Mobile Crew ... Test Flight Results
*****

*****  Saturday, April 6, 1996 - 1600-2300Z

Test flight went PERFECT.  After five hours of perfecting the engineering of our boom and feedline, we made a 25 minute flight with great results!

Here's how the day went:

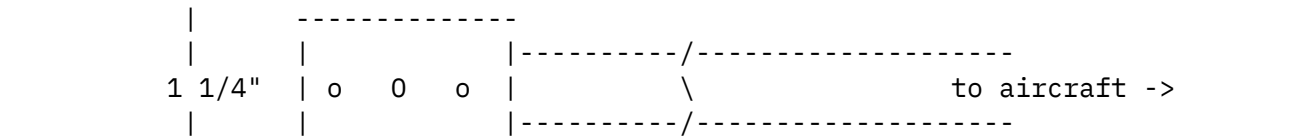
Arrived at Falcon Field at 9AM.  Parked the twin Cessna at the base of the tower and surrounded it with my Blazer, Doug's Suburban, and a couple other trucks.  Then, got down to some serious work.

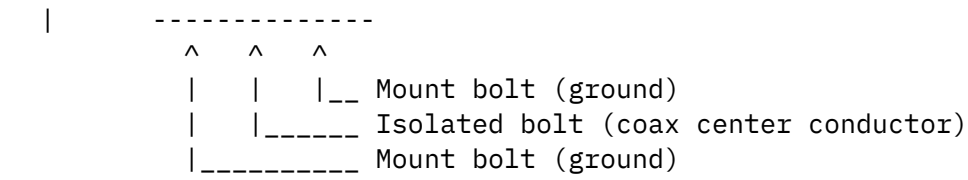
The empennage access panel was removed and the LORAN RG-58 chasssis mount BNC connector at the aft bulkhead was located.  We attached a length of 58 to it, and fed it back to the tail.  Of course, it was carefully fed between the spars and frame to ensure that it would stay put (and not become entangled with the control surface cables).  The tailcone was removed and the coax was pulled out of the rear of the tail.  This tailcone was left off for the flight.

Next, a 1"X1/8"X6' steel boom was custom fitted to the tail.  This piece was drilled with four holes to match some machine screws on the underside of the horizontal stabilizer.  We had to remove the existing screws and replace them with some others which were abt 1/8" longer.  This ensured us with a good bond of the boom to the tail.  BTW, the boom was kept at 6 ft in length so that the feedpoint was kept well beyond the end of the craft.  Very important to avoid a conflict with the antenna and the control surfaces!

Before mounting the boom on the tail, Doug did a wonderful engineering job with the longwire connection at the end of the boom.  His design employed a portion of an old Motorola mobile mount frame.  After cutting off the ends of it, it was mounted with two bolts to the end of the boom.  In between the two bolts was a third bolt ... of course, it was countersunk into the "insulator" (old plastic Motorola frame) -- it is where the longwire would attach.  Either of the two "mount" bolts is where the coax's shield would connect (we determined, with the use of an HF Analyzer, that the airframe made a WONDERFUL counterpoise!)

Diagram of the end of the boom and its coax connectors:






Of course, we only had to use one of the "ground" bolts.

The coax was extended from the tailcone, wrapped around the boom on down to the connectors, and was attached to the bolts at the end of the boom.

Next, we attached a 35 ft 22 gauge wire to the center bolt. Then, finally, the boom was firmly attached to the underside of the horizontal stabilizer.

Phew! What a job ... it looked good, but would it fly? (no pun intended :)

Next, the cabin was set up as a ham shack. Then, Stephen (KC7OMT) was appointed as the "observation post" and he drove out to the side of the runway to observe the take off and low pass. After starting engines and taxiing just short of the take off point, I jumped out of the plane and let out all 35 ft of wire -- ready to go!

After a successful take off, 'round the pattern, and successful flyover (with a GREAT report from our ground observer of "that pretty yellow wire following us!"), we flew eastbound fer abt 10 mins. This was about 2PM MST. I called CQ several times on 7.038, but no luck. I was getting a 1:1 match on the antenna, so I KNEW there was no problem getting out.

Then, I switched to phone. I found the 7.240 swap net and heard CA. I asked for a "break" so I could get a sig report, but the net control chastized me for "interrupting and not waiting my turn." Little did he know that I was 3,000 ft above PHX flying at 180 MPH. Oh well, at least I know that it worked!

Then, Doug jumped on his HT and contacted a local fellow who jumped on HF to chat with me. Our groundwave condx weren't good, so we barely made contact. But, IT DID WORK! IT WORKED! IT WORKED! IT WORKED!

SO, bottom line is this ... all is a GO. We will be doing the whole shootin' match on April 27th.

Special thanks go to Doug (WB7TUJ), Ron (AB7LL), Stephen (KC7OMT), John Harry (no call), and JoAnne Thompson (no call) my Mom, for all their effort and dedication to bringing this wild idea of mine, Jay Miller's and Paul Harden's, to fruition.

AB7PF/AM is alive!

73,

Steve - AB7PF


+---------------------------------------------------------------------+
|                                 _________                           |
| Steve C. Thompson - AB7PF      ____/____  E-mail kj7dn@primenet.com  |
| Manager of Info. Technology   ____/____            steve@cpginc.com  |
| Continental Promotion Group _____/H___                              |
| Tempe, AZ, USA                    H        Current Projects:        |
|                                   H        Explorer II 40M, 40-40   |
|                                   H                                 |
| 602.731.3535                      H        QRP-L #259  scQRPions #1 |
|                                   H        NWQRP #387  NorCal #1516 |
|                                                                     |
+---------------------------------------------------------------------+


From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: scicior@cp.uswc.uswest.com (Steve Ciciora)
Subject: [6938] Antenna Analyzers (Home Brew)
Message-ID: <9604102158.AA25585@sp5-316.nts.uswest.com>

  All this talk about antenna analyzers has got me thinking...
Put a D/A converter on my VCO, an A/D on the Forward and Reverse settings
on my OH-1 wattmeter, (A/D and D/A are serial chips hooked to my printer port),
a little code, a little calibrating the VCO with a frequency counter, and I
can sweep the frequency going to the antenna I want to tune and measure
the SWR over the entire band.  What do commercial antenna analyzers measure
that this wouldn't, and how can I measure that?  Any thoughts?
Steven Ciciora
KB0PJF

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: NYOUNG@nova.wright.edu
Subject: [6943] BNCs on RG174 +c
Message-ID: <01I3E23QR3WI8WZ1BA@nova.wright.edu>

Funny Jim should mention that he's had a bit of a trouble with RG174 style BNCs. Me too, but in a different way. First off, there must be about 12000 different versions of what ends up being stamped on the cable as RG174. That alone is enough to make you wanna call fer yer medication.

I was lucky to get some non-teflon RG174 as part of a surplus wire disposal. Just enough for a 40m antenna feed line. I think it's still around. At the same time, I also ended up with two different bags of BNCs which the dealer (over the phone and it's a long story that I won't get into) assured me would fit RG174. No special tool needed.

So the first bag of BNCs were like any normal BNC except that the center pin had a very tiny hole in it for the wire (which fit nicely in both types of RG174) and a ferule that was swaged. As in the piece had a wide diameter at one end and a smaller diameter at the other. The wide end fit over the BNC part where the braid/shield goes. The narrow end fit just about perfectly the surplus RG174. I used a $15 crimp tool on it and it worked fine. No problems. At first.

The other bag of BNCs had a whole pile of what I figured was "extra stuff to suit all occasions." One piece in particular was a little piece of clear teflon (or some similar heat resistant stuff) that fit over the center conductor (but not over the center conductor's insulation). The ferule was the same size stem to stern. And it was only slightly larger than the part of the BNC that it was supposled to crimp (with shield) to. When I tried (3 different ways) to crimp this BNC I first of all couldn't get the braid and ferule over the part what it was supposed to crimp to. And the little piece of insulation kept pushing the center pin out through the front of the BNC. Had to use one of those fancy "multi-die"  crimpers. It was a pain and I'll never try that again. Good thing I didn't have the axe and the pistol.

The BNC & RG174 that worked is still in one piece. The short piece that I'd planned on using to hose a radio to a tuner got loose after a while and I needed to re-crimp it. At last check, it was still around, although I haven't used it (and that's yet another story).

So the deal is: there are many different BNCs that get sold as RG174 compatible. I'd bet that there are only three or four that really are "compatible." More likely the rest are definite finalists in the "user surly"

catagory. Personally, I'd like to have a couple more of
the ones that did work, but right now I'd just settle
for some BNC connectors that I can crimp on to RG8X.
The last ones that I used for RG8X were in a bin marked
"BNC for RG6." I bought the entire stock (about 12) and
used 'em. They'be been perfect performers. And I didn't
need a $89 crimping tool either.

I guess if you wanna fight with coax what'll probably
suck up all yer output before it gets to the radiating
elemoont, RG174 is fine. My experience is that it's
easier to make jumpers out of RG8X with whatever kind
of crimp on BNC you want to use. And by the way, Kings
makes a crimp on PL259 that works great on RG8X. No
special tool or inserts or whatever needed.

Nuff said.

73
Nils
WB8IJN +c

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: bill@techline.com (Bill Todd-N7MFB)
Subject: [6909] Bounced from Beacon Test?
Message-ID: <199604100715.AAA03474@wishkah.techline.com>

Hello - I sent two signal reports to randy re. his beacon in Missouri.
I heard it just fine "up" here in Bay Center, WA...but both messages
were bounced back to me.

Do I have his address wrong (i.e., AK0B/B): randy@crl.com

Thanks - Bill
Bill Todd-N7MFB

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Larry East <LVE1@inel.gov>
Subject: [6936] Chokes for 40-9er
Message-ID: <2.2.16.19960410203150.274fa106@garnet.inel.gov>

For what its worth, 5 or 6 turns of #30 wire thru a #43 bead will produce an
inductance of 15 to 20 uH -- might try that for the PA choke. A bead is,

after all, just a small toroid...

72, Larry W1HUE/7

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: prvalko <prvalko@oakland.edu>
Subject: [6937] Comet Hyakutake
Message-ID: <Pine.OSF.3.91.960410172201.819A-100000@saturn.acs.oakland.edu>

For some reason hams seem to be interested in many SIMILIAR other hobbies.

For those of you interested in astronomy, I took an very nice (IISSM)
photograph of Comet Hyakutake last month and posted it on my home page at
http://ww.acs.oakland.edu~prvalko

Probably not earth shaking news unless you know I have night-blindness
and could barely see the comet with my own eyes.

73! =paul= wb8zjl

ObQRP - started putting the 49er together last night, dontcha DARE
start a 49er-Foxhunt without me :-)

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "Brian.Buydens@usask.ca" <buydens@duke.usask.ca>
Subject: [6907] Digital VFOs
Message-ID: <Pine.OSF.3.91.960409233152.15534A-100000@duke.usask.ca>

First of all thanks to Larry Jones N50SG for making that list of
semiconductor companies available.  I made an html version of his mail
message and linked it to my web page for ham radio

http://www.usask.ca/~buydens/ham

Armed with this I went back to my May 1995 copy of QST to look at the
"Weekend DigiVFO" by James Craswell, WB0VNE.

I noticed that two of the pieces the HSP45102PC-40 and
the CA3338AE are made by Harris (which is in Larry's list).  I found
a data sheet on the CA3338AE available by internet but unfortunately the
information for the HSP45102PC-40 is only available by fax.  I don't have

a fax.  Would someone who has this information be willing to scan it and make it available as JPEGS (or something like that).  However, if it is really long please don't go through a lot of trouble for my sake.  I'll figure something else out ;-)

Here is a newbie question.  In the design in QST the DAC is the CA3338AE which Harris describes as a CMOS Video Speed 8-bit R2R D/A Converter. Therefore 4 lines from the HSP45102PC-40 have to be ignored (causing a less than perfect sine wave).  Could I use a HI5731 which is described as a 12 bit high speed converter instead of the CA3338AE?  It would seem that this would give a better sine wave and therefore less harmonics to filter out.

BTW thanks for the wonderful discussion on digital VFOs.

73 de VE5RDV (where we don't have daylight saving time)

+--------------------------------------------------------------------------+
| Brian Buydens, Computing Services, University of Saskatchewan            |
| email: Brian.Buydens@usask.ca                                            |
| VE5RDV                                                                   |
+--------------------------------------------------------------------------+
| Albert Einstein, when asked to describe radio, replied: "You see, wire   |
| telegraph is a kind of a very, very long cat.  You pull his tail in New  |
| York and his head is meowing in Los Angeles.  Do you understand this?    |
| And radio operates exactly the same way: you send signals here, they     |
| receive them there.  The only difference is that there is no cat."       |
+--------------------------------------------------------------------------+

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: wdzeares@rockdal.aud.alcatel.com
Subject: [6912] FS: NIR-10 w/ver. 4 software
Message-ID: <9604101329.AA01163@aud.alcatel.com>

For Sale: a JPS DSP-NIR-10 w/ver. 4 software. Asking $150 and I will pay shipping.... or will consider best offer... need to sell to buy different toys (like 30M rig)... I paid to much for it so make offer.... 72/73 dennis k3ets dallas
email: work wdzeared@aud.alcatel.com and home wdzeares@ix.netcom.com

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Larry East <LVE1@inel.gov>
Subject: [6942] HAMCALC Programs

Message-ID: <2.2.16.19960410234215.218f424a@134.20.32.17>

For anyone else who is interested, the HAMCALC programs can be obtained via anonymous FTP from oak.oakland.edu -- download two files:

```
  /pub3/hamradio/arrl/qst-binaries/hcal-10.txt     (instructions - 1 kB)
  /pub3/hamradio/arrl/qst-binaries/hcal-10.zip     (actual programs - 500+ kB)
```

For those who don't know, this is a collection of ham radio related programs compiled from various sources by VE3??? (sorry, forgot his call) for use on MS-DOS machines. It might be a good idea for someone who has more time than I do to copy these files into the "tools" directory of the QRP-L FTP site since the question of where to find 'em seems to come up every few months.

72, Larry W1HUE/7

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "Ford, Steve,  WB8IMY" <sford@arrl.org>
Subject: [6916] HW-8 parts
Message-ID: <316BCE0D@arrl.org>

It is still possible to get parts for the Heath HW-8? In particular, I must replace the main tuning capacitor. I tried calling Heath, but I do not have a manual and the clerk wanted part numbers only to perform a search.

73 . . . Steve, WB8IMY

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: NYOUNG@nova.wright.edu
Subject: [6939] In ze mailbox, old man!
Message-ID: <01I3DVVVKIPK8WYS81@nova.wright.edu>

I opened the mailbox today and found SPRAT inside. I opened the wrapper and looked at the articles and the drawings. It is full of neat stuff. Only one problem....

I want to whine about not getting all my regular monthly periodicals today! It ain't fair! SOme people got QQ (to which I don't sub... [and don't even ask]) and QRPp (to which I do sub... [and don't even ask]) and SPRAT all in one swell foop. But not me. Noooooo. I have to WAIT! I'm not goooood enough to get aaaalllll my magazines at once!

It's a plot, I tell you! They (who we don't know and
probably couldn't pronounce their names even if we did)
are controlling the mail! It's them, I tell you! Them and
those damn hippie rock groups like the Austin Lounge Lizards!
Yeah! Them! They're SUSPECT PERSONS, man! Body Thetans! Yeah,
they're holding BODY THETANS on a big farm in Arizona where
there used to be a WHOLE CIVILIZATION of SUPERIOR BEINGS
from outter space who came here generations ago to start a
whole new SUBGENIUS of people that look just like you and me
but THEYYYYYAAAAARRRRRNNNNN''''TTTTT! No! They're controlling
the mail with little wires that come out of those staple
machines that they use in those quick print places that you
see all the time with your name on the box of lightbulbs
now and then they tell me! I ain't GONNA stand here and
BAKE THIS CAKE any more! You understand me?!?!?!? No,
I didn't get my magazines. I didn't get my special ordered
copy of _Literary Outlaw: The Life & Times of WIlliam
S. BUrroughs_ that I tried to buy on remainders from VERMONT!
EVeryone knows about THEM! And how about the INTERNATIONAL
JOURNAL OF EPITROCHASMUS!?????!!!!??!?!?!? HOw about that???????
How come it didn't come today? You got a reason for that?
Huh, PINK BOY?

I want my magazines and I want 'em now! Before the nurses
come back and discover that I've removed this ALIEN
DUCT TAPE that they put on me when I had to take the prenatal
exam on that FLYING saucer that I found in the back yard
with just a little bit of strawberry shortcake on it shorting
out my radio waves?!? YOu can't tell me about that, because
I KNOW ALL ABOUT IT ALREADY! ANd how do I know that you're n
not one of them? Huh?

So there!

Now I owe someone a Dayton Hamvention Hotdog. One of the
$4.98 ones with everything on it. Yeah, even those little
beads that they use when the mason jar opens up and lets
all the ideas out that go into the dog house and keep me up
all nightlights return to post. "I'm just a technical
sergeant in the Shakespeare battalion" huh? Likely story!

and by the way.... 73

Nils
WB8IJN +c
I told you not to open that phone book! Now get away from
there before they REALLY get mad and take away our pretzels!

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: David Johnson <djohnson@acpub.duke.edu>
Subject: [6947] KnightLite Round Table
Message-ID: <Pine.SOL.3.91.960410222240.11917A-100000@godzilla1.acpub.duke.edu>

Hi Gang:

We had 14 make it onto the net control's log last Sunday, and it was a real fun session!  Some new folks from last week were back, and it was great to hear them, as well as welcome friends who have been with us for awhile.

Everyone is invited to participate, no matter what kind of rig, what power, or what age or what political party ;-) because everyone is welcome on the KnightLite Round Table on Sundays at 10 pm local eastern time on 3710 kHz.  Let's see if I can get this right - (shiver, shake) that is 0200 UTC.  Send CW at whatever speed you find comfortable and the net control station will tryto answer at that speed!

Of course, we encourage low-power stations to participate, as we are a QRP group!  Sometimes we have stations operating a few tens or a few hundreds, of milliwatts, and usually most can copy!  We have found that with a half-decent antenna system, we only need a couple hundred milliwatts for quite reliable operation on the net!

We had fun last Sunday just saying whatever was on our minds about life or QRP (aren't they inseparable?), and I was ncs with 5W out.  I was pleasantly surprised to find much activity on the official net freq, and actually ran the net about 1 kHz higher than the nominal net freq.  That seemed to work out though, as we had a good group of check-ins!  It was real nice to find that QRN was low, but this may not last for long so let's enjoy while we can - haha!

Hope to meet lots of QRPers - KnightLites included - at the Raleigh hamfest this coming Sunday!

Here was the group on the Round Table last Sunday:

| Call | Notes |
|---|---|
| WA4NID | ncs, 5w |

| | |
|---|---|
| KC4URI | 599 |
| AD4ZE | 599 |
| AA6UL | 579 |
| W8KUX | 589 |
| AA4XX | 569, 100 mW |
| AC4ZO | 599 |
| AE4IC | 569 |
| N4NTO | 579 |
| KB4MNG | via internet/N4NTO |
| N4EKP | 589 |
| N3GO | 589, 250 mW |
| WJ2V | 599 |
| WA4SGC | 579 |

72,

Dave

David W. Johnson, Ph.D.
Amateur Radio Extra WA4NID
email: djohnson@acpub.duke.edu
packet: WA4NID@KB4WGA.#DUR.NC.USA.NOAM

QRP ARCI 6546
G-QRP 4864
NorCal 355
TSRAC 3482

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6902] MC145170 PLL Anyone?
Message-ID: <316b30e9.pandora@pandora.lugs.org.sg>

Hi Gang,

To follow up on the suggested PLL VFO, I've checked up on some prospective parts. In particular there is this Motorola MC145170 which looks really good to me (but I am not that experienced with PLL) so I thought maybe I'd find out what some of the experts here think.

One of the major problems with PLL's is that it is difficult to achieve the small tuning steps necessary for HF amateur operation. This is typically 100 Hz, maybe less on some high end equipment. But I think 100 Hz is quite sufficient where I come from. The PLL frequency can be represented by the following formula:-

fO = N * fREF * P

where fO is the output frequency, N is the programmable divider, fREF is the reference oscillator frequency and P is the external prescaling. For the case where no external prescaler is used (is this possible), P = 1 so the equation now becomes:-

fO = N * fREF

From the above equation, we can see that the channel spacing is constrained by fREF. Thus for a tuning step of 100 Hz, fREF needs to be a very accurate 100 Hz. Now, if fO is to be say 5 MHz, you will find that N works out to be 50,000. Unfortunately most PLL's are built with 14-bit dividers yielding a division of only 16,000+ which is insufficient. Looking at the data book, I found that the MC145170 in fact has a 16-bit divider which gives us a division in the range of 40 to 65535. What this means is that with a 100 Hz fREF, we can use the part, without external prescaling, to generate frequencies from 4 kHz to 6.5 MHz in steps of 100 Hz. Of course, this is not possible in practice because the VCO limits the range of frequencies possible. What it does mean, as far as I can tell, is that it should not be difficult to implement a PLL controlled VFO for a frequency that falls anywhere in that region, while retaining a tuning step of 100 Hz.

Now as for the fREF, the part actually has a programmable prescaler for the fREF with a 15-bit divider. This means you can take almost any suitable crystal filter and have it divided internally to the required 100 Hz reference frequency. This helps out on the stability question. I suppose if the VFO frequency is below about 3 MHz, you can achieve 50 Hz tuning steps even with the said part. Typical current peaks for this 16-pin part is about 1.6 mA with quiescent currents of about 100 uA.

For VFO frequencies higher than about 6 MHz, I think one will have to resort to:-

1. DDS
2. Dual-modulus prescaling PLL's
3. Dual PLL loops
4. Mix down, etc.

All are somewhat more complicated than with the above mentioned MC145170 part.

So, is my analysis correct? Comments from more experienced designers? Am I on the right track? Did I overlook anything important?

73 de 9V1ZV Daniel
--
Daniel Wee | daniel@pandora.lugs.org.sg

9V1ZV | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: Jim.Nestor@ey.com
Subject: [6934] Nix on the BNCs & RG-174
Message-ID: <00145000027690460000004*@MHS>

A few weeks ago, I posted that I had found some nice crimp-on BNC connectors fro RG-174. I successfully created one short cable to use with a QRP rig. At that point, I had justed tested it for continuity and it looked OK.

Last night, I inserted the aforementioned cable between my NN1G 30 meter rig and the tuner and a loop antenna which I just finished before the SNOW fell in NJ. Naturally, the antenna wasn't the right length and gave me an SWR of about 2.8:1.

I inserted a little MFJ Random Wire tune and tweaked it a bit to make the SWL-30 happy at 50 ohms until I can trim the antenna. But I digress...

Everything seemed to work just fine with a piece of RG-58 and BNC connectors between the rig and the tuner. Was getting about 1-1/4 watts out and the SWR at the rig was 1:1. In fact, I snagged an I2 station and got a 549 report.

When I replaced the RG-58 with the RG-174 cable things went sour, I got all sorts of nasty key clicks and audio feedback in the rig. Had to reduce the drive to about 1/2 watt to clear it up. Put the RG-58 back and everything worked as before.

My best guess is that the connection of the shield in the RG-174 to the connectors wasn't a good RF "fit", hence the feedback problem. Don't know if it's the crimp-on connection or if RG-174 just doesn't have decent enough shielding in the first place. Any thoughts?

Looks like I'm back to RG-58 for the time-being.

73/72,

Jim, WK8G/2
jim.nestor@ey.com

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Marti Sawyer <mart@bga.com>
Subject: [6919] NorCal 40A / Antenna Tuner ?
Message-ID: <199604101452.JAA27356@zoom.bga.com>

Anyone have any suggested antenna tuners/power meter circuits which could possibly be small enough to stick inside the NorCal 40A ?

I'm relatively new to the kit building process, and I really like how compact the NorCal 40A is, but now need to make sure I've got all the stuff together to take the rig with me when I go camping.  I thought I'd throw up a 40 m dipole at the campsite.  Do I really need to worry about a tuner if it's a properly measured dipole?  If I do need a tuner or power meter to check swr does anyone have suggestions about how to built these into the rig?

Tnx,

Mart N5SXV

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: KE3FL@delphi.com
Subject: [6910] OHR WM-1 blown, help!
Message-ID: <01I3DCZUARZM9ANA0N@delphi.com>

Last night I made a modification to both my OHR WM-1 and to my NE-4040/30. To the 30/40 meter NE40404 I removed one winding from L1 & moved it up to the Novice section, then added a switch & some caps so I could switch between 7040 and 7140.  Seems to work fine.  I'll let you know about drift as soon as I get more time on it.

Now, to the problem.  I added a requlator to the WM-1 so I could pipe in 12V & run the thing.  Works fine, or at least it did until I pumped in 1W of pwr while the poor thing was on 100 mW.  I seem to have blown the LM358, but if anyone knows if I may have taken anything else along the way I'd like to know it.  It was trying to draw 2 AMPS! on 9volts with the LM 358 in the circuit, but when I removed it everything went to ZERO.

Thanks in advance & I'll post the conclusion when I have it fixed.
73 de KE3FL/Phil
:-)

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: pelt@vt.edu (Randy Pelt)

Subject: [6932] PC Board Software??
Message-ID: <199604101815.OAA13792@sable.cc.vt.edu>

Can someone tell me where I can find software to design printed circuit boards.  I know there's pretty much nothing out there for Macs but will settle for PC software (freeware or commercial).

Many tnx for the help.

73


```
*******************************************************
*Ranson J. Pelt                                       *
*Internal Audit Manager                ___  _________ *
*Virginia Tech 0328                   \  \/ __    __/ *
*Blacksburg, VA 24061                  \    / /  /    *
*(540) 231-9475  FAX (540) 231-4681      \_/ /__/     *
*                                                     *
*QST de nz4i      Semper Fi                          *
*******************************************************
```


From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: earwax@indy.net
Subject: [6917] problem
Message-ID: <199604101520.KAA27965@IndyNet.indy.net>

Help me please,

Background:  Last August I resubscribed to QRP ARCI.  I had let my membership expire and had
moved.

Problem:  I've not received a QRP-Quarterly since my renewal.  Before somebody flames me for not taking care of this privately, I had 3 or 4 e-mail contacts with Mr. Bryce and thought I had the situation straightened out last December.

Could somebody please get me on the Quarterly mailing list before it's time to renew again.

Thanks es 73,

Charlie,ARCI #8209

4530 N.15th Street
Terre Haute,IN 47805-2412

Charlie Kuhn, N9NVV
earwax@indy.net
Censor Yourself, Not Others
All Disclaimers Apply

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: adams@chuck.dallas.sgi.com (chuck adams)
Subject: [6927] Projects
Message-ID: <199604101712.RAA20348@chuck.dallas.sgi.com>

Gang,

Here is the deal(s):

The NorCal club has enough projects going, so they thought
that someone else (club) might be interested.

1. I have a board layout for the marker generator. It
   goes to any and all clubs interested. You do the work
   to find all the parts, board shop like FAR, etc.
   I figure around $4-5 costs etc. You price to cover
   postage etc. Heck, you can lay out the board in
   15 minutes or may have someone already that can do
   it and has the PC software. Let me know.

2. Working on the noise bridge using the MC1350. It's
   next. This is a more basic design than in the handbook,
   but with all the SWR bridges and small meters now it may
   not be all that necessary. I'll let you know what I find
   out.

3. The 8051 keyer was going to take too much current and is
   on hold and the board was going to be larger than the
   NorCal 8044ABM board. There are already several other
   keyers out there. Don't know if I need to continue this
   puppy.

If you read my previous post, I did not say that I was getting
in to the kit business. No way Jose or Nils. I already got

email for how to order but really guys I did not say I was going
to do it.  I just prototyped and it works great and replaces the
ARRL old marker.

NorCal did a few hundred of the St Louis Tuner kits.  That's it
from them.  St Louis Club has all rights, so maybe they'll take
it up or offer it to another club.  Time will tell.  But from
my observations doing the kit business is not all that much fun
and it surely takes a lot of personal time from a lot of people
to do it right.  And one thing that is required and this is very
important is about $1,000 or so up front for initial costs for
capital outlay for a good sized kit.  That kind of money is hard
to come by in a ham club.  Unless times have changed.  :-)

FYI
--
Chuck Adams (K5FO CP-60)  adams@sgi.com
Box 181150, Dallas, TX  75218-8150

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: af852@rgfn.epcc.edu (William R Colbert)
Subject: [6922] Q-dope
Message-ID: <9604101546.AA13672@rgfn.epcc.Edu>

Jim, I don't think you would have much to worry about - we have
enough problems trying to intercept the real "dope" without having
to look for other stuff.  Especially since the Administrator? is
putting all of our experienced agents out on the street to buy
dime baggies for local area suppression.  72/73  Ray

--
Ray Colbert, W5XE/V31XE, El Paso, Tx

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Joe Spencer <jspencer@metronet.com>
Subject: [6915] QRP Reading Material Arrives
Message-ID: <Pine.HPP.3.90.960410093642.8277A-100000@fohnix.metronet.com>

Hi Gang,

Well if I was happy when I got my latest QRP ARCI Quarterly in a timely
manner a couple of weeks ago...I am now estatic!!!

Last night when going through my mail I found I had received not one, not two, but three more in one day!  HAMBREW SPRING 1996, SPRAT Spring 1996 and QRPp March 1996!!!
I have already read alot of each but as always with these great periodicals, they provide excellant reference information and I reread them many times enjoying the articles again as much as the first time.
 So  for those watching their mail in anticipation... the current mailings of these have reached North Texas at least.

Hmm...Now let's see when does the NE '72 come out???

72, Joe KK5NA

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Jim Stafford-W4QO <w4qo@america.net>
Subject: [6946] QRP-ARCI - Do you belong?
Message-ID: <Pine.SV4.3.91.960410215459.19966B-100000@atl1>

If you are a member of this list and do not belong to the QRP Amateur Radio Club International, I would like to know why you do not if you would care to share it with me.  As a new board member, I would like to receive your input prior to the Dayton meetings.  I am not suggesting that everyone should belong, but if you have suggestions on what we could do to "get your membership", I would like to hear them.  Responses might range from -never heard of it to  -forgot to renew to  -don't care for magazine to ???????  Your input is appreciated.

Let me know if you were a member at one time, if you would.  I will compile the results in summary form and post them to the list.  I will keep any input private as to the identity of the respondent.

Jim Stafford, W4QO
11395 West Road
Roswell, GA 30075-2122
770-993-9500
Packet:W4QO@WA4BRO.#atl.ga.usa.na

RadioActive Schools(sm) -
Using amateur radio as
a teaching tool in north
Georgia area schools.
Internet: w4qo@america.net
QRP-L #267  QRP-QRCI #6515  G-QRP #5588  MiQRP #897  NorCal  NoGaQRP

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Brian.S.Allen%NCAOCISD@smtpgw.aoc.state.nc.us
Subject: [6921] QRP-L digest 324
Message-ID: <m0u71yx-0001IGC@aoc.state.nc.us>

IS THERE ANYONE THAT CAN GIVE ME ADVISE ON USING A NEOPHYTE 40 MTR RECEIVER
WITH A 5 WATT TRANSMITTER.  THEY WERE BOTH PURCHASED THRU 624 KITS.
I AM HAVING TROUBLE ALIGNING THE RECEIVER FREQ. WITH THE TRANSMITTER.
IS THIS RECEIVER EVEN WORTH THE TROUBLE??

ALSO,  IS THERE ANYONE FAMILIAR WITH THE ATLAS 350XL.  I WOULD LIKE
TO GET IT GOING ON QRP BUT I AM HAVING TRANSMITT PROBLEMS.

THANKS  KB4MNG BRIAN
WILLIAMSTON, NC

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: lhalliday@creo.bc.ca
Subject: [6923] Re[2]: Synthesized VFO block
Message-ID: <9603108291.AA829153278@mail.creo.bc.ca>

As an alternative to multiple loop synthesis and DDSs - which are
great fun, but tend to be current hogs - how about a compromise,
something like this...

Use a PLL for coarse tuning, say in 1 or 2 kHz steps. A step size this
big allows the loop to lock quickly. For fine tuning within the steps,
use a VXO at the receiver's IF. If it only needs to tune a couple of
kHz, it can be extremely stable.

I have a receiver (FRG-7) that does something like this - it uses a
Wadley loop (not a PLL, but related) to tune in 1 MHz steps to a VHF
1st IF, converts down to a 3 MHz 2nd IF, and does its fine tuning
there.

Laura Halliday VE7LDH         "C'est une femme mutine, assez
lhalliday@creo.bc.ca           elegante, grave et legere, ayant le
ve7ldh@amsat.org               sens du confort et du plaisir
Locator: CN89mg                en tout." - C. Deneuve

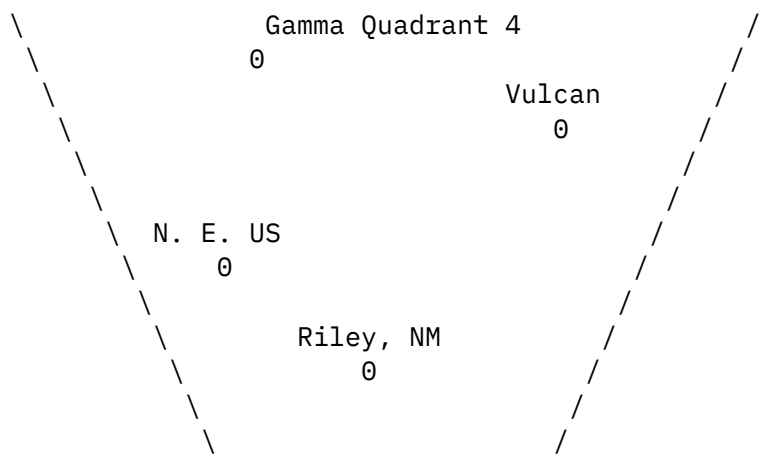
From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: bkassel@enet.net (Brian Kassel)
Subject: [6941] Tetra AZ ScQRPion QRP FD Update
Message-ID: <199604102305.QAA01339@maple.enet.net>

ScQRPion QRP to the Field Update

On 4-10-96, Floyd, NQ7X and Myself went up to the proposed site
at White Tanks State Park and paid our money to reserve the area.
We then carefully scoped out the area and mapped out how we would
erect our  antennas.
4 partially enclosed Ramadas will be made availble to us.

Directions:
>From the junction of loop 101 and Olive, take Olive west for 10 miles.
You will run into the gate for the park.  It may or may not be manned.
If you are only staying for the day, pay the gatekeeper 2 bucks.
If you are going to camp, the camp hosts will pick up your 5 bucks
when you get all settled in.
At this point, Olive becomes "White Tank Mountain Road".
Same road, only the name has changed.
Proceed about another 10 miles to "Willow Canyon Road", turn left.
You can't turn right here anyway!
Go about1/2 mile to the area where we all will be, it is on the right.
If you are going to camp, remember that at least Floyd and I will arrive
on Friday 4-26  around noon to put up the giant vee and beam.
We will be staying until Saturday evening, and expect to leave the
park by 8:00 P.M.  There is plenty of room to camp, so bring anything
from a tent to a 50 foot rig.

And now for something completely different:
The Vee antenna is a specially formulated design which has been hacked out
on a Cray model 10,000  mark VII computer with cryogenic cooling enabled,
at a facility located near hanger 13 at a secret air base in CA.
Special authority has been procured from several government agencies
(including the Black Helicopter squadron) to allow for such intense
radiation to be released into the public domain.  Due to severe Government
security restrictions, we can not release any specific data.  Well we could,
but then we would have to kill you.
We will however divulge a cursory radiation pattern of the device as shown
below:



\  White Tanks Park /
0

Brian
W5VBO

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: KFGlynn@aol.com
Subject: [6914] Thanks for the info
Message-ID: <960410101953_510091118@emout07.mail.aol.com>

Hello everyone,

Wanted to thank everyone who responded with comments on EZNEC modeling
software and 40M rigs a while back.  Not to save the money to get both...

73 Kevin KB2TEO

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Pete Meier WK8S <pmeier@sun.tir.com>
Subject: [6929] Time's almost up.....
Message-ID: <316BF476.7B81@tir.com>

Time is almost up for getting your tickets for one of the most
exciting events for QRP'rs going to Dayton Hamvention 96....
The 3rd Annual ARCI QRP Banquet   (ADVANCED TICKET PURCHASE REQUIRED)
Held at 7:00PM Friday May 17, 1996 at the Days Inn South in
Miamisburg, OH.
Don't miss your change for an delicious sit down dinner with the
nicest folks around....your fellow low power enthusiasts. You also
will have the pleasure of hearing 2 special guest speakers and have a
chance to win a desirable door prize. All this for only $13!!!
BUT TIME IS RUNNING OUT...SEND THAT CHECK AND SASE(STAMPED SELF
ADDRESSED ENVELOPE) NOW  payable to:

Pete Meier
4181 Rural
Waterford, MI  48329

--
Member of ARRL, ARCI, MI-QRP, G-QRP, NE-QRP, CQC
Pete Meier WK8S QRP-L#212 Email: pmeier@tir.com
Waterford, Michigan  USA

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: af852@rgfn.epcc.edu (William R Colbert)
Subject: [6920] vertical guying
Message-ID: <9604101543.AA12974@rgfn.epcc.Edu>

Dave, I don't use the R-5, but do have a pair of Cushcraft AP8 verticals and even tho the literature says they will handle winds of 80 mph, I don't feel comfortable with the mechanical joints, so I have three guys (nylon rope1/8 inch and at times have used seine cord).  Here in West Texas, makes one feel more secure.  My verticals are at 12 feet above ground.  With the guys, they have gone thru some 80-90 mph winds with no damage.  One thing I have found is that with a lot of wind, the clamps on the trombone capacitor sections do loosen, causing some erratic operation - this is also true for the R-7, so something to check periodically.  72/73  Ray

--
Ray Colbert, W5XE/V31XE, El Paso, Tx

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: KFGlynn@aol.com
Subject: [6913] Who requested Loop ant info?
Message-ID: <960410101955_510091150@emout09.mail.aol.com>

Hello Gang,

Sorry but my hands are too quick.  A gentlemen requested info re: small loop antennas.  I have two articles from QST from Mar 68 by W1ICP Lewis McCoy and Jun 86 by Ted Hart W5QJR.  I can fax or mail copies if you'd like.  Robert Capon WA3UHL (RobCap@aol.com) authored an article in QST re: small loops as well, but don't have that issue on hand.  Perhaps he can help.  PS. I also have info from a German ham on loops as well - but in German!  May have more info at home too.  The Antenna Book covers loops as well.

Let me know if you'd like info.

73 Kevin KB2TEO

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: KE3FL@delphi.com

Subject: [6911] WM-1 question & Thanks for the VHF
Message-ID: <01I3DDCW85V696WFE9@delphi.com>

First I forgot to ask: I assume that once I install a new LM358 into the WM-1 I'll have to recalibrate.  YES?  Anything else I may have forgotten?

Thanks to all those who sent the VHF info.  It boils down to:

To subscribe send an e-mail to: vhf-request@w6yx.standford.edu
                                Message text: subscribe vhf

Thanks again to: Jim W8AC, John VE6XT, and Jay WA5WHN
72 & 73 de KE3FL/Phil
:-)

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Alan Kaul <kaul@netcom.com>
Subject: [6945] Re: 40-9er harmonics
Message-ID: <Pine.3.89.9604101815.A3071-0100000@netcom19>

John, and other 40-9er fans:

Using my 40-9er (Board A) I measured 15 dB of second harmonic suppression the first time I tested it, and 16 dB the second time I tried it.  Both times, the analysis was performed on a Motorola R-2000 Communications Analyzer.  My results varied by some 10 dB with John's post reported today on the list.  I hope my measurements were wrong -- because I'd like to think that the rig has better suppression than I was able to find.  It is possible the analyzer I used was not working properly, OR that I inaccurately made my measurements OR that the parts I installed were off tolerance (listed values: C17=270pf, RFC5=2.2uH, C18=470pf), etc.

Has anyone else measured the output on their 40-9er's?  Theoretically, we should all be getting approximately the same results.

[<Alan Kaul, W6RCL>] kaul@netcom.com

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: N9DD@aol.com
Subject: [6928] Re: Hey Warmup under way on 30M
Message-ID: <960410133934_372789123@mail04>

In a message dated 96-04-09 17:36:11 EDT, you write:

>On Mon, 8 Apr 1996, David D. Meacham wrote:
>
>> Chuck,
>>
>> I don't mind daylight time, but I HATE the time CHANGE.
<snip>.

>> 72, Dave, W6EMD, Redwood City, CA
>
>Dave, there is a place for you in Canada....it is called Saskatchewan.
>There is a catch....its north of North Dakota and has been known to get
>somewhat colder than  California in the winter. ;-)>
>
>
>Dr. Rick Zabrodski BSc, MD, CCFP(E)    *                VE6GK

Well, it still gets cold here, but not quite as bad. Most of Indiana stays on the same time (EST) all year. Of course, being only a couple miles from Michigan here in South Bend, it still gets confusing around time change time.

...reminds me of a cartoon I once saw - it showed a sign reading "Welcome to Indiana! Set your watch back 100 years".

Tom  N9DD
South Bend, IN
QRP-L #32
See you at the Hamvention!

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: Jim Eshleman <lujce@hooch.cc.lehigh.edu>
Subject: [6918] Re: Lead Acid Battery Charger
Message-ID: <96Apr10.113154edt.57461-12924+24@hooch.CC.Lehigh.EDU>

Allen and Gang,

  $7.00 or so sounds pretty good from A&A or Jade.  The following are listed as distributors of the UC3906 in the 1995 Handbook:

Allied Electronics
Hamilton/Avnet
Hallmark Electronics
Future Electronics
NU Horizons

The only address in the HB is for Allied:

7410 Pebble Dr
Fort Worth, TX  76118
800-433-5700
A $25 minimum order is indicated

73
Jim N3VXI

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: GREGOIRE@endor.com (ERNEST GREGOIRE)
Subject: [6940] Re: QRP Reading Material Arrives
Message-ID: <199604102256.SAA131554@nss2.CC.Lehigh.EDU>

>To: jspencer@metronet.com
>From: GREGOIRE@ENDOR.COM (ERNEST GREGOIRE)
>Subject: Re: QRP Reading Material Arrives
>
>>Hello Joe, Jim Fitton and a crew is putting the 72 newsletter together for
>mailing this Thursday. It will be mailed just after that,I'm guessing maybe
>on Friday or Saturday.
>
>73 de AA1IK
>
>Ernie
>>
>>Hmm...Now let's see when does the NE '72 come out???
>>
>>72, Joe KK5NA
>>
>>
>>
>
de AA1IK          N.E.-QRP-C. # 202   ( Lead by example, It is better to    )
                  QRP-L member #95.   ( pull a string than it is to push it.)
Ernie Gregoire
RR 1 Box 221
Canaan, NH. 03741

New England QRP Club, information
available on request by sending me a
 S.A.S.E. or via E-mail.

e-mail : GREGOIRE@ENDOR.COM
packet : AA1IK@WA1WOK.FN43FE.NH.USA

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "Dana H. Myers" <myers@bigboy.West.Sun.COM>
Subject: [6925] Re: Re[2]: Synthesized VFO block
Message-ID: <Roam.3.0.829154847.8675.myers@bigboy>

> As an alternative to multiple loop synthesis and DDSs - which are
> great fun, but tend to be current hogs - how about a compromise,
> something like this...

PLLs are actually pretty mild on current, but DDSs are certainly
healthy current consumers...

> Use a PLL for coarse tuning, say in 1 or 2 kHz steps. A step size this
> big allows the loop to lock quickly. For fine tuning within the steps,
> use a VXO at the receiver's IF. If it only needs to tune a couple of
> kHz, it can be extremely stable.

The same technique can be used with a PLL - replace the inner loop with
an LC or VXO oscillator.  This way you still have a fixed 1st IF and
can use a narrow crystal filter right after the 1st mixer.  You still
get the main advantages of a multi-loop synthesizer as long as you can
figure out what frequency you're one ;-).

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: nskousen@scientech.com (Niel Skousen)
Subject: [6924] RE: Synth.VFO's
Message-ID: <v02130506ad9194ba0b3d@[198.60.91.132]>

for a minimum complexity PLL design another alternative is to use a 1-2 kHz
step size and pull the reference freq (ie VXO for the ref.).  The QRP+ uses
such a scheme relatively well....

Niel

-----  -.. .  .-- .- --... ... ... .-   ------------
Niel Skousen,                 nskousen@scientech.com
SCIENTECH Special Projects
208-525-3742,  529-4721 (FAX)                 WA7SSA
-----------------------------------------------------

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "Dana H. Myers" <myers@bigboy.West.Sun.COM>
Subject: [6926] RE: Synth.VFO's
Message-ID: <Roam.3.0.829154987.8668.myers@bigboy>

> for a minimum complexity PLL design another alternative is to use a 1-2 kHz
> step size and pull the reference freq (ie VXO for the ref.).  The QRP+ uses
> such a scheme relatively well....

The downside of this is the reference is multiplied, not offset.  In other
words, the output of the loop is fRef * N, not fOffset + fRef; as you
increase operating frequency, the tuning sensitivity also increases.

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: scicior@cp.uswc.uswest.com (Steve Ciciora)
Subject: [6935] RE: Synth.VFO's
Message-ID: <9604102021.AA25134@sp5-316.nts.uswest.com>

> for a minimum complexity PLL design another alternative is to use a 1-2 kHz
> step size and pull the reference freq (ie VXO for the ref.).  The QRP+ uses
> such a scheme relatively well....
>
> Niel

Similar to what I am thinking about using, but using a DDS instead of a VXO.
I've also seen having a 1kHZ step size mixed in with a 1kHZ range VCO.

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>

Subject: [6897] Re: Synthesized VFO block
Message-ID: <316b165f.pandora@pandora.lugs.org.sg>

On 09 Apr 1996 12:16:11 -0400, "Glen Leinweber" <leinwebe@mcmail.CIS.McMaster.CA>
wrote:
>    Laura Halliday had a good suggestion recently: don't try a PLL
> at these frequencies - getting a fine step size (100 Hz or less?) is
> too difficult. She suggested the DDS (direct digital synthesis) approach.

Actually it is possible to get 100 Hz quite easily, considering our
bandspread is only perhaps 100 KHz on 20M.

>    I notice that price was not on your "good" shopping list.
> While DDS's are a little expensive, they meet all your other
> requirements. The Analog Devices chips are pretty nice.

Problem is I don't know how to use the DDS or how difficult it is to build.
It should not be too expensive either.

>    You will require the microcomputer to set its frequency. I

This is not too difficult.

73 de 9V1ZV Daniel
--
 Daniel Wee | daniel@pandora.lugs.org.sg
 9V1ZV      | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6898] re: Synthesized VFO block
Message-ID: <316b1c38.pandora@pandora.lugs.org.sg>

On Tue, 9 Apr 1996 13:40:51 -0600, "Steve Ciciora" <scicior@cp.uswc.uswest.com>
wrote:
> are down far enough) but not good enough for receiving.  What is done is
> setting up a DDS with a reference crystal that is a multiple of 2 (4.096
> MHz, etc) and have it output frequencies in 1/256 hz increments.  Then use
> a PLL to multiply it up by 256 to get 1 Hz increments.  The DDS provides
> long term stability, and the PLL removes the phase noise (short term
> stability).  This is what I hope to do somday in my spare time...
> Steven Ciciora
> KB0PJF

Hi Steven,

Yes this is often done for DDSes. Unfortunately doing this rather complicates the project which is something I do not want to do. I would rather see the whole thing use only one PLL IC and maybe a JFET VCO. I would like to keep it small but if we go the above route, it is bound to get messy and that will put me (and probably a number of other people) off. I suppose we could get something working first, and let everyone get a feel of what is involved with a PLL design, and then take the next step from there if performance is not good enough. That way we can all learn something new.

73 de 9V1ZV Daniel

--
Daniel Wee | daniel@pandora.lugs.org.sg
9V1ZV | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6899] re: Synthesized VFO block
Message-ID: <316b1b73.pandora@pandora.lugs.org.sg>

On Tue, 9 Apr 1996 11:57:36 -0700 (PDT), "Dana H. Myers" <myers@bigboy.West.Sun.COM> wrote:
> Given that PIC microcontrollers are ideally suited for the job of programming
> serial PLLs and sell for < $10 from many sources, they're pretty appealing.

True.

> If I just had the time, I've been thinking about making available a
> program for a PIC that interfaces an LCD and rotary encoder to the
> Motorola PLLs. It just isn't that hard...

Actually I can't find any retailers for them rotary encoders here so I have not had a chance to play with.

> By the way, almost any HF synthesizer you build will require some work
> to get better than 1KHz tuning steps. The single-loop that works well
> with 5KHz steps will not work well with the kind of tuning step required
> for HF CW/SSB.

Well some of the Motorola parts are really easy to use, and they come with dual-modulus prescalers. This should allow better resolution and since we are mostly looking at a fairly narrow bandspread (100 kHz) or so, I shouldn't think it would be too hard to achiece say a 100 Hz tuning step. Though a 10 Hz one would be nicer but would probably require a DDS.

Want to help me work this out?

73 de 9V1ZV Daniel

--
 Daniel Wee | daniel@pandora.lugs.org.sg
 9V1ZV      | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6900] Re: Synthesized VFO block
Message-ID: <316b17b4.pandora@pandora.lugs.org.sg>

On Tue, 09 Apr 1996 18:00:05 -0400, "Jim Kortge, NU8N" <jokortge@tir.com> wrote:
> Hi Daniel, I'm really interested in the project you're
> proposing.  I'm gonna check the Motorola web page and see if
> the chip info is available there.  I don't have access to their
> manuals.

Look at the MC145170 and application note AN1207. The circuit is very easy
to build and all we need is a nice and clean VCO. In fact, I think we can
use most of the existing VFO's if we throw in a varicap diode.

> Any ideas regarding the power consumption of the digital
> approach?  I think low power consumption is what has driven
> the designs to date, and the lack of pahse noise, but a

I wouldn't worry too much about phase noise for our application. I believe
the thing can't be using too much power, it's just one IC for the whole
application with minimal support chips. The MCU might require a little more
power but lets get a working unit and then worry about trimming down the
power consumption through use of CMOS parts etc. My MCU is CMOS already.

> low power digital design sure would be nice from a drift
> (or lack of) point of view.

Yes. Though the PLL can lock the drift in any case.

73 de 9V1ZV Daniel
--
 Daniel Wee | daniel@pandora.lugs.org.sg
 9V1ZV      | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6901] re: Synthesized VFO block
Message-ID: <316b1a67.pandora@pandora.lugs.org.sg>

On Tue, 9 Apr 96 14:46:24 EDT, "N1OOQ Tom R. @ MRO1  09-Apr-1996 1426"
<randolph@est.ENET.dec.com> wrote:
> One thing I'd love to see is an interface chip that allows an experimenter
> to control one of the programmable freq synth chips using a simple interface
> such as thumbwheels. Ideally, this chip would be done without any fancy

Parallel PLL's lend them to this process though it does not use BCD. It
would be easy to program an MCU to read a thumbwheel, or an optical shaft
encoder which would be more fun.

> programming tools or equipment, and would be easily available, something like
> the Curtis chips for keyers. I think something like this is what's needed for
> freq synthesis to really catch on in the homebrew community.

This is exactly what I would like to see, a PLL VFO block.

> Microcontrollers are ok, it's just that I think people are a bit wary of
> buying a ~$75 part from a sole source that will likely go away within 6

Bzzzz.... wrong answer. I am not referring to microcontroller boards. You
can buy a MCU (such as the 87C51 from Signetics or a number of other
manufacturers) for about US$14 in Singapore, add one crystal and 2
capacitors, provide a +5v regulated decoupled supply and you're in business.
Well, you need another resistor and capacitor for the reset circuitry. We're
NOT talking about $75 here. And once we get a working design, we can ditch
the 87Cxx UV part (UV eraseable EPROM, windowed chip) and go for the OTP
(one time programmable part) which is much cheaper. These parts contain RAM,
EPROM, Serial UART, Ports, all on the same MCU (40 pin part, or less on some
derivatives). So don't let the MCU bit scare you away. It kept me away for
so long until I figured out how easy it was and wondered why I had not tried
them earlier. I can now throw a working MCU circuit together in about 10-15
minutes. No need to worry about PCB's or the many interface and glue
circuitry, or the multiple data bus lines for external RAM or ROM.

> months. It's not that tough to find air-variables at flea markets, but no
> one wants to learn how to program microcontrollers if their VFO breaks 6
> months from now.

More often than not, you won't need to reprogram the MCU if something
breaks. If indeed it is a software problem we can all work it out together
but that is not something I forsee as needing a lot of doing once we get

past the development stage. Besides, I am sure the assembly language is easy to learn for many people. I picked it up in 2 days, one day reading the data sheet and another playing with the MCU. If you have any assembly programming background, especially with Intel parts, it won't be that much different.

73 de 9V1ZV Daniel
--
Daniel Wee | daniel@pandora.lugs.org.sg
9V1ZV | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: "W. Daniel, 9V1ZV" <daniel@pandora.lugs.org.sg>
Subject: [6903] re: Synthesized VFO block
Message-ID: <316b349e.pandora@pandora.lugs.org.sg>

On Tue, 9 Apr 1996 19:55:40 -0700 (PDT), "Dana H. Myers"
<myers@bigboy.West.Sun.COM> wrote:
> even when using a pre-scaler. The problem with small tuning steps is the
> very low loop filter cutoff, which results both in longer lock-up time
> and poor suppression of close-in reference sidebands. You really want to

I had thought about the lock-up time associated with low reference frequencies, such as at 100 Hz. Just how big a problem are we looking at here? I am not sure what the close-in reference sidebands refer to though.

> use as high a step as possible to control the reference sidebands and

I had a gut feeling this was the case but the equations did not tell me that outright.

> speed up lock time, and then fine tune the loop using another synthesizer
> or maybe even an LC VFO.

I am open to suggestions. I just posted something on the Moto MC145170 which will in fact support 100 Hz steps if I understand it correctly. I do not know how this will bear on the above mentioned problems though. The N divider is 16-bits so for a fREF of 100 Hz, we can theoretically support up to 65535 * 100 = ~6.5 MHz which is just nice for our application, in 100 Hz steps. How about using a second 1:1 PLL to filter out the sideband problem? As for lock up time, I was wondering about this because it might be a problem if we wanted to implement digital RIT or split frequency operation and the thing takes a long time to lock up upon every keydown in a full QSK system. For a partial QSK system it is probably not as bad. Do I understand this correctly?

> > Want to help me work this out?
>
> Sure!

Thanks! For now this MC145170 part looks really good due to its flexibility and simplicity. The lockup time may be a problem but depending on how serious this is, we might be able to work around it or live with it. The sideband problem I am not too sure but at 100 Hz, it should be quite easy to build a very sharp active bandpass filter if one is needed. I am still not very sure what the exact problem is here but I suppose it might be the remixing of the fREF into the rest of the frequencies, in which case a second 1:1 PLL might resolve the problem.

If we're going to use a second PLL, then we might as well use the MC1658 VCM (Voltage Controlled Multivibrator) in a monolithic package to simplify the design and use the VCO only on the second PLL.

73 de 9V1ZV Daniel
--
Daniel Wee | daniel@pandora.lugs.org.sg
9V1ZV | daniel.wee@f516.n600.z6.fidonet.org

From owner-qrp-l@Lehigh.EDU Wed Apr 10 22:21:03 1996
From: "Dana H. Myers" <myers@bigboy.West.Sun.COM>
Subject: [6905] re: Synthesized VFO block
Message-ID: <Roam.3.0.829104940.12883.myers@bigboy>

> On Tue, 9 Apr 1996 11:57:36 -0700 (PDT), "Dana H. Myers"
> <myers@bigboy.West.Sun.COM> wrote: > Given that PIC microcontrollers are
> ideally suited for the job of programming > serial PLLs and sell for < $10
> from many sources, they're pretty appealing.
>
> True.
>
> > If I just had the time, I've been thinking about making available a
> > program for a PIC that interfaces an LCD and rotary encoder to the
> > Motorola PLLs. It just isn't that hard...
>
> Actually I can't find any retailers for them rotary encoders here so I have
> not had a chance to play with.

Digi-Key sells a Clarostat optical rotary encoder - it is a little pricey but you only need one ;-). Alternative, you can use thumbswitches if they're less expensive...

> > By the way, almost any HF synthesizer you build will require some work
> > to get better than 1KHz tuning steps.  The single-loop that works well
> > with 5KHz steps will not work well with the kind of tuning step required
> > for HF CW/SSB.
>
> Well some of the Motorola parts are really easy to use, and they come with
> dual-modulus prescalers. This should allow better resolution and since we
> are mostly looking at a fairly narrow bandspread (100 kHz) or so, I
> shouldn't think it would be too hard to achiece say a 100 Hz tuning step.
> Though a 10 Hz one would be nicer but would probably require a DDS.

The dual-modulus pre-scaler simply allows you to retain a given step size
even when using a pre-scaler.  The problem with small tuning steps is the
very low loop filter cutoff, which results both in longer lock-up time
and poor suppression of close-in reference sidebands.  You really want to
use as high a step as possible to control the reference sidebands and
speed up lock time, and then fine tune the loop using another synthesizer
or maybe even an LC VFO.

> Want to help me work this out?

Sure!

Dana


 * Dana H. Myers KK6JQ, DoD#: j | Views expressed here are mine and should *
 * (310) 348-6043               | not be interpreted or represented as     *
 * Dana.Myers@West.Sun.Com      | those of Sun Microsystems, Inc.          *


From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: "Dana H. Myers" <myers@bigboy.West.Sun.COM>
Subject: [6908] re: Synthesized VFO block
Message-ID: <Roam.3.0.829117074.31620.myers@bigboy>

> On Tue, 9 Apr 1996 19:55:40 -0700 (PDT), "Dana H. Myers"
> <myers@bigboy.West.Sun.COM> wrote: > even when using a pre-scaler.  The
> problem with small tuning steps is the > very low loop filter cutoff, which
> results both in longer lock-up time > and poor suppression of close-in
> reference sidebands.  You really want to
>
> I had thought about the lock-up time associated with low reference
> frequencies, such as at 100 Hz. Just how big a problem are we looking at
> here? I am not sure what the close-in reference sidebands refer to though.

There's a trade-off between loop lock-up time and reference sideband

suppression.  Reference sidebands are the result of reference frequency leaking through the loop filter and frequeny modulating the VCO.  The first few pairs are the worst.  You can do a pretty good job of estimating the sideband level and loop lock-up time - the Motorola app notes are very good in this respect.

> > use as high a step as possible to control the reference sidebands and
>
> I had a gut feeling this was the case but the equations did not tell me that
> outright.

There are equations for this in the Motorola Communications Book DL136

> > speed up lock time, and then fine tune the loop using another synthesizer
> > or maybe even an LC VFO.
>
> I am open to suggestions. I just posted something on the Moto MC145170 which
> will in fact support 100 Hz steps if I understand it correctly. I do not
> know how this will bear on the above mentioned problems though. The N
> divider is 16-bits so for a fREF of 100 Hz, we can theoretically support up
> to 65535 * 100 = ~6.5 MHz which is just nice for our application, in 100 Hz
> steps. How about using a second 1:1 PLL to filter out the sideband problem?

A 1:1 clean-up loop would basically just reproduce those close-in sidebands unless you had a loop bandwidth considerably more narrow than the first PLL.

Another problem with using a high value of N (as a result of the low reference frequency) is the reference noise may become an issue inside the loop passband.  A value of 65,000 would mean that phase noise in the reference would be increased by 96dBc; assuming the phase noise floor of the reference divider is -150dBc (a number I've gleaned from the net as typical for the CMOS dividers), the PLL output would have a phase noise level only -54dBc inside the (very narrow) loop bandwidth.  Outside the loop bandwidth you'd pretty quickly see the VCO noise dominate.  The noise inside the loop bandwidth may not be that much of an issue depending on how noisy the VCO is to start with.  Keep in mind, you could have a perfect VCO and you'd still see that noise inside the loop passband.

The technique to look at is to use a heterodyne oscillator.  The heterodyne oscillator doesn't have to be that quiet, and it can make a lot of things easier.  For example, suppose you use a DDS which tunes from 6.0 to 6.1MHz to mix with the VCO output, and the VCO tunes from 7.0 to 7.3MHz.  You could use a reference of 100KHz, which results in a range of N from 10 to 13, representing a maximum of only 2dB of reference noise deterioration, and really allowing the VCO noise to dominate (which means design a good VCO ;-). The VCO output would mix with the DDS output in a balanced mixer, with major outputs at 1MHz and 13MHz - a few stages of LC filtering would be enough to reduce the 13MHz image.  The PLL loop bandwidth could be 1KHz, which would

allow a decent lock-up time with good rejection of the 100KHz reference component, and you might even see some reduction of close-in VCO phase noise.

This is just an example of why this approach is interesting, your fuel economy may vary ;-).

> As for lock up time, I was wondering about this because it might be a
> problem if we wanted to implement digital RIT or split frequency operation
> and the thing takes a long time to lock up upon every keydown in a full QSK
> system. For a partial QSK system it is probably not as bad. Do I understand
> this correctly?

Yup, tuning would be a pain if the VCO followed very slowly or was very lightly damped and bounced for a long time on every tuning change.

Dana

From owner-qrp-l@Lehigh.EDU  Wed Apr 10 22:21:03 1996
From: kd7s@valleynet.com (Bill Jones)
Subject: [6944] Re: VXO Research
Message-ID: <199604110115.SAA24613@valleynet.com>

JEVERHART@cayman.vf.mmc.com wrote:

>One interesting approach uses an artificial "quarter wave line" to invert the
>low series resistance of a crystal to a high parallel value and it "swaalows
>up" the parallel capacitance to give somewhat linear tuning.
--snip--

I'd love to hear more about this approach.

>I'm working up several ideas along this line as time permits and will write
>them up in ham and qrp newsletters.  Also, if anyone is interested I can
>provide a bibliography.  Let me know and I'll post the info tomrrow.
>

I'd be very interested in a bibliography.  I did a "lunch-hour" search at my local library today and found an interesting article by Larry Lisle, K9KZT in the October, 1973 issue of QST.  In it he describes a VXO capable of pulling a 9.5 mHz crystal some 100 kHz.  I find that a little hard to accept up front, but then, what do I know?

The question that always comes to mind is how does one tell when the crystal is no longer in control and the VXO becomes an LC oscillator instead?  I suspect there may be a sudden jump in frequency when that happens but I'm

not sure.  Would anybody care to enlighten me on this?
==========
Bill Jones - KD7S <><
QRP-L Member #85
Sanger, California
Reply to kd7s@valleynet.com
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